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A MECHANICAL TIMING DEVICE FOR LABORATORY SPRAYING TESTS *

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In laboratory tests of various sprays against overwintering codling moth larvae cocooned in grooved wooden pupation sticks (1-3/8" x 5/16" x 6-3/4"), it was necessary to regulate the length of time and the position of each lot of sticks while being sprayed. In order to make all lots as nearly uniform as possible the following device was developed as illustrated and described.

On the base (fig. 1, A), measuring 7-5/8" x 31-1/2", two uprights (C) were built 37" high. Two rollers, 2-1/2" x 6-1/2", were placed between these two uprights to carry a canvas belt (F). On this belt, at intervals of approximately 1 foot, were riveted 6 heavy tin cleats (G) to hold the pupation sticks. These cleats were bent in such a way as to clasp the lower ends of the sticks and hold them against the belt.

Attached to the main base (A) was another base (B) for the motor (E), for which an electric fan motor was used, with the fan removed. Over this motor a cover (H) was built to protect it from the sprays. On the base (A) a worm gear (D), formerly a reduction gear in a "Jersey" centrifuge, ratio 10 to 1, was connected by belt with the motor (E) and with the large 10" V pulley (I) on a shaft to turn the rollers and revolve the belt (F). On the fan motor is a 1-1/2" V pulley, on the worm gear shaft with which it operates is a 2" V pulley, and on the worm gear shaft carrying the belt to the 10" pulley is a 1-1/2" V pulley.

This set-up, with the fan motor running at low speed, revolves the belt carrying the sticks at a rate of about 30 seconds for a revolution, or 5 seconds for each cleat of sticks to pass through the spray.

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* This machine was developed at the Yakima, Wash., laboratory in the course of control experiments against the overwintering stage of the codling moth. The writers are indebted to C. W. Murray and John F. Cassidy, now of the Bureau of Agricultural Chemistry and Engineering, for helpful suggestions.

This machine was used with a spraying set-up composed of a 1/4-hp. electric motor (fig. 2, A), a compressor (B), and a 1-pint capacity paint gun (C). The paint gun was set or held on the stand (D) at the same distance each time from the moving objects being sprayed.

The speed of the belt carrying the objects to be sprayed can, of course, be readily regulated by changing the speed of the fan motor and by using a different ratio of pulleys.

List of Materials

1 piece 25/32" x 7-5/8" x 31-1/2" S4S1/ -- Base
1 piece 25/32" x 7-5/8" x 19" S4S -- Motor base
2 pieces 25/32" x 1-5/8" x 37" S4S -- Uprights
2 pieces 25/32" x 1-5/8" x 7" S4S -- Brace
1 piece 25/32" x 1-5/8" x 10" S4S cut 45° -- Brace
2 pieces 25/32" x 1-5/8" x 2-3/4" S4S cut 45° -- Corner braces
1 piece 25/32" x 1-5/8" x 8-1/2" S4S -- Base plate
2 pieces 25/32" x 1-5/8" x 27-1/2" S4S -- Braces
3 pieces 25/32" x 1-5/8" x 5-1/2" S4S -- Worm gear mounting
1 piece 25/32" x 1-5/8" x 1-3/4" S4S -- Worm gear brace
1 piece 25/32" x 1-5/8" x 4" S4S -- Brace
2 wood rollers 2-1/2" x 6-1/2"
3 lag screws 3/8" x 3"
1 lag screw 1/2" x 4"
1 piece canvas -- Belt 6" x 72"
5 metal pupation-stick holders -- attached to belt
1 reduction gear 10 to 1
1 10" V pulley
1 2" V pulley
2 1-1/2" V pulleys
1 V belt 1/2" x 58"
1 V belt 1/2" x 38"
1 5-gal. oil can cut out to cover motor
2 belt guards

1/ Surfaced 4 sides.

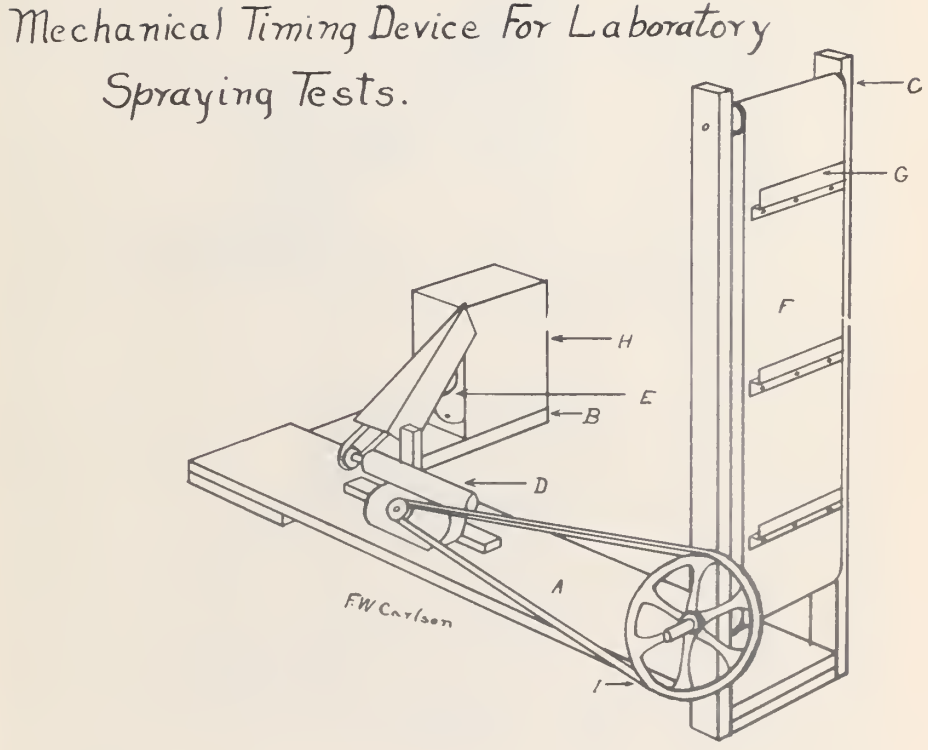
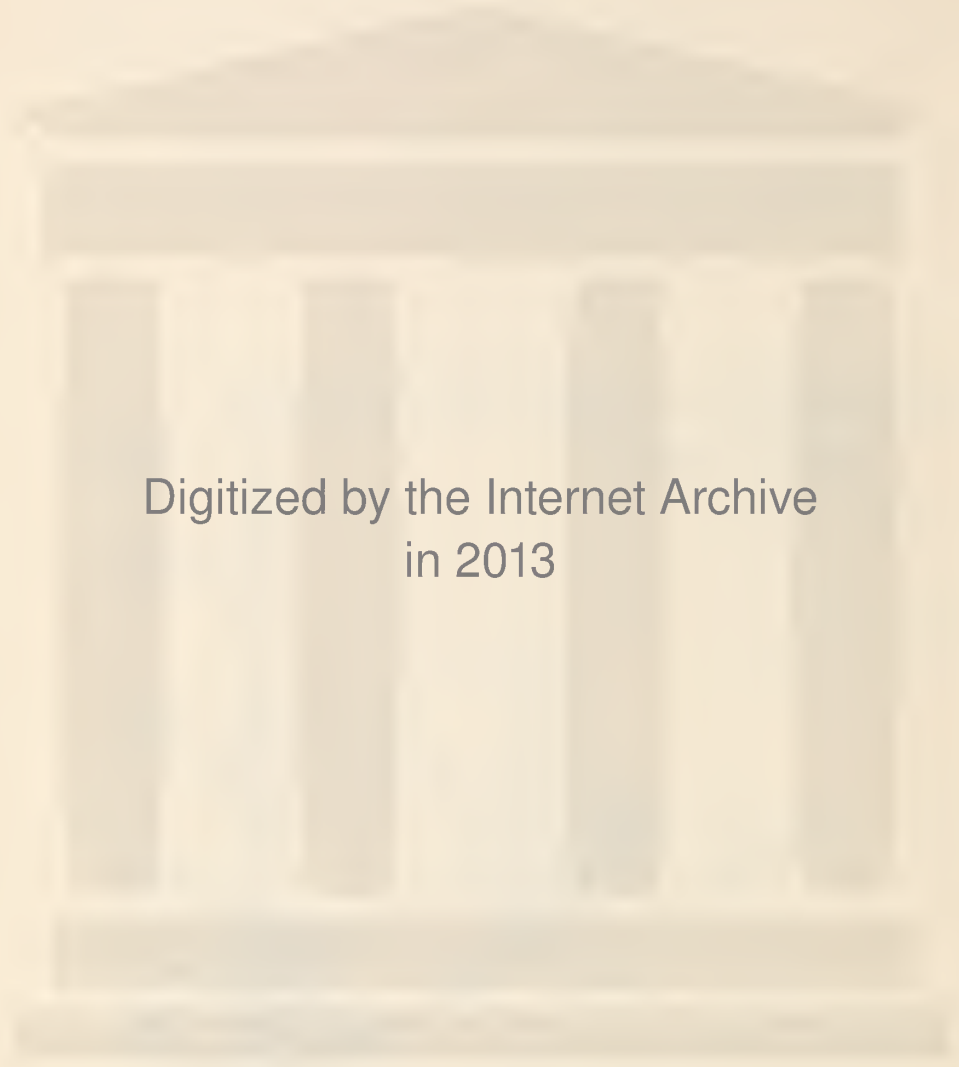


Figure 1.—A, Base; B, motor base; C, uprights; D, worm gear; E, motor; F, canvas belt; G, metal pupation-stick holders; H, motor cover; I, large pulley.



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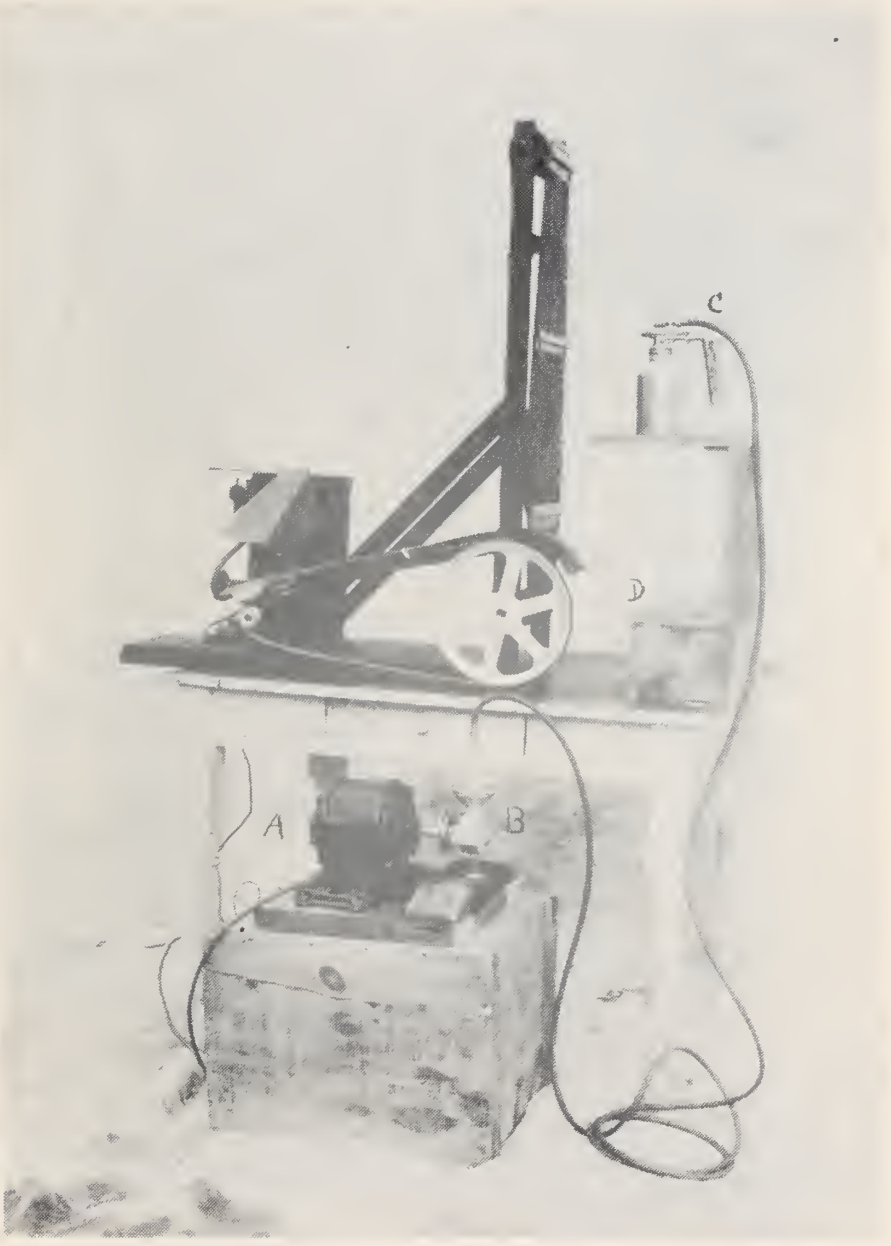

Figure 2.--Complete timing device (as diagrammed in figure 1) and spraying set-up. A, Electric motor; B, compressor; C, paint gun; D, paint-gun stand.

Figure 3.--Mechanical timing device from a different angle from that shown in figures 1 and 2.

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